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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/799,660	03/15/2004	Ryan D. Bruneau	IMMR-0101A	8598

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EXAMINER
LESPERANCE, JEAN E

ART UNIT	PAPER NUMBER
2629	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/799,660	BRUNEAU ET AL.	
	Examiner	**Art Unit**	
	Jean E. Lesperance	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _26 December 2007_.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _28-61_ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _28-61_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _15 March 2004_ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _10/1/2007_.

4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

1. The amendment filed December 26, 2007 is entered and claims 28-61 are pending.

Response to Arguments

2. Applicant's arguments filed December 26, 2007 have been fully considered but they are not persuasive. The applicant's representative argued that the prior art does not teach a sphere. Examiner disagrees with the applicant because the prior art, Rosenberg et al, teaches and object Fig.1 (34) which can be a mouse (not shown) inherently includes a ball which when moves over a surface moves the cursor on the display screen. The applicant's representative further argued that the prior art does not teach at least one complaint element coupled to the housing, with the at least one complaint element configured to amplify the haptic feedback. Examiner disagrees with the applicant because the prior art, Rosenberg et al, teaches the object Fig.1 (34) which represent a mouse inherently includes a support base coupled to the housing of the mouse (not shown). The applicant's representative further argued that the prior art does not teach a first signal by movement of a spherical surface with respect to a sensor in contact with the spherical surface. Examiner disagrees with the applicant because an object Fig.1 (34) which can be a mouse which can puts out an electrical signal by moving it on the surface to control the cursor on the display screen. The applicant has to amend the claims to overcome the prior art of record. Therefore, the rejection is maintained.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 28-61 are rejected under 35 U.S.C. 102(b) as being unpatentable over USPN 5,734,373 ("Rosenberg et al.").

Regarding claim 28, Rosenberg et al. teach a housing (object Fig.1 (34)); a sphere positioned in the housing (Object Fig.1 (34) which can be a mouse which inherently includes a ball underneath to move the cursor as the mouse moves on the top of a surface), the sphere being rotatable in at least one rotary degree of freedom; a sensor (28) coupled to the housing (34) and configured to output sensor signals associated with a movement of the sphere in the at least one rotary degree of freedom (Fig.1 (28)); and an actuator (30) coupled to the housing (34) and configured to output haptic feedback approximately along an axis that is substantially normal to a point of the sphere extending from the housing, the haptic feedback being based on the sensor signals, wherein when the user applies a force on the object (sphere), it provides a haptic feedback based on the sensor signal felt.

Regarding claim 29, Rosenberg et al. teach inertial mass coupled to the actuator (the magnitude of forces applied to the object or sphere (34) is coupled to the actuator (28), the actuator and the inertial mass collectively configured to output the haptic feedback, the haptic feedback being an inertial haptic feedback wherein the combination if the magnitude of forces applied to the sphere and actuator is a haptic

feedback.

Regarding claim 30, Rosenberg et al. teach when the microprocessor detects the user object moving outside this snap distance, it turns off the groove forces. This snap-out feature can be implemented equally well by the host computer 12 sending a clear command to turn off forces. Also, a deadband DB can also be provided to allow the user object to move freely near the center groove position C, specified with a deadband command parameter. A style command parameter indicates the orientation of the groove along one or more degrees of freedom (e.g., horizontal, vertical, diagonal). For example, horizontal and vertical grooves can be useful to provide forces for scroll bars in windows. A user moving a cursor in a graphical user interface can feel groove forces moving the cursor and user object toward the middle of the scroll bar (column 38, 22-35).

Regarding claim 31, Rosenberg et al. teach when the microprocessor detects the user object moving outside this snap distance, it turns off the groove forces. This snap-out feature can be implemented equally well by the host computer 12 sending a clear command to turn off forces. Also, a deadband DB can also be provided to allow the user object to move freely near the center groove position C, specified with a deadband command parameter. A style command parameter indicates the orientation of the groove along one or more degrees of freedom (e.g., horizontal, vertical, diagonal). For example, horizontal and vertical grooves can be useful to provide forces for scroll bars in windows. A user moving a cursor in a graphical user interface can feel groove forces moving the cursor and user object toward the middle of the scroll bar (column 38, 22-

35).

Regarding claim 32, Rosenberg et al. teach Position control is not a popular mapping for traditional computer games, but may be used in other applications such as medical procedure simulations or graphical user interfaces. Position control is an intuitive and effective metaphor for force feedback interactions because it is a direct physical mapping rather than an abstract control paradigm. In other words, because the user object experiences the same physical manipulations as the entity being controlled within the computer, position control allows physical computer simulations to be directly reflected as realistic force feedback sensations. Examples of position control in computer environments might be controlling a paddle in a pong-style tennis game or controlling a cursor in a windows desktop environment (COLUMN 37, LINES 4-17).

Regarding claim 33, Rosenberg et al. teach Host commands may include commands to provide forces on the user object such as restoring forces, vibration forces, texture forces, a barrier forces, attractive/repulsive force fields, damping forces, groove forces, and a paddle-ball force. Typical command parameters include a magnitude parameter, a duration parameter, a direction parameter, a style parameter, and a button parameter to control the force output by the actuator. This provides a high level, standard force feedback command protocol for the efficient use by developers of force feedback software to be implemented on the host computer system (column 4, lines 27-37).

Regarding claim 34, Rosenberg et al. teach other parameters can be used to provide a variety of haptic sensations to the user through the user object 34 to simulate

many different types of tactile events. For example, typical haptic sensations may include a virtual damping (described above), a virtual obstruction, and a virtual texture. Virtual obstructions are provided to simulate walls, obstructions, and other uni-directional forces in a simulation, game (column 19, lines 39-46).

Regarding claim 35, Rosenberg et al. teach object 34 which is cover potion to gimbal mechanism 140 which is part of the housing for the object (see Fig.7).

Regarding claim 36, Rosenburg et al. teach the object Fig.7 (34) is like a button to provide input to a host computer.

Regarding claim 37, Rosenberg et al. teach the microprocessor controls actuators to provide forces on the user object and provides the sensor data to a host computer that is coupled to the interface device. The host computer sends high level host commands to the local microprocessor, and the microprocessor independently implements a local reflex process based on the high level command to provide force values to the actuators using sensor data and other parameters (abstract).

Regarding claim 38, Rosenberg et al. teach force feedback control parameters ("force parameters") are internal parameters that are provided or updated by command process 384 and are used by force algorithm computation and actuator control process 388 (see Figure 18).

Regarding claims 39 and 40, Rosenberg et al. teach Rosenberg et al. teach a housing (object Fig.1 (34)); a sphere positioned in the housing (Fig.7 (34)), the sphere being rotatable in at least one rotary degree of freedom; a sensor (28) coupled to the housing (34) and configured to output sensor signals associated with a movement of the

sphere in the at least one rotary degree of freedom (Fig.1 (28)); and an actuator (30) coupled to the housing (34) and configured to output haptic feedback approximately along an axis that is substantially normal to a point of the sphere extending from the housing, the haptic feedback being based on the sensor signals, wherein when the user applies a force on the object Fig.1 (34) (sphere), it provides a haptic feedback based on the sensor signal felt; and 17b and 17c, ball 352 is moving into the compliant paddle or "sling". Preferably, a simulated mass of ball 352 is felt by the user through user object 34 which is appropriate to the simulated velocity of the ball, the simulated compliance of the paddle, and the strength/direction of simulated gravity. These parameters can preferably be set using a host command with the appropriate parameters (column 40, lines 16-28).

Regarding claim 41, Rosenberg et al. teach at least a portion of the sphere extends from the housing, the haptic feedback being output approximately along an axis substantially normal to a point of the sphere (see figure 7 where part of object 34 is extending in the gimbal mechanism).

Regarding claim 42, Rosenberg et al. teach Position control is not a popular mapping for traditional computer games, but may be used in other applications such as medical procedure simulations or graphical user interfaces. Position control is an intuitive and effective metaphor for force feedback interactions because it is a direct physical mapping rather than an abstract control paradigm. In other words, because the user object experiences the same physical manipulations as the entity being controlled within the computer, position control allows physical computer simulations to be directly

reflected as realistic force feedback sensations. Examples of position control in computer environments might be controlling a paddle in a pong-style tennis game or controlling a cursor in a windows desktop environment (COLUMN 37, LINES 4-17).

Regarding claim 43, Rosenberg et al. teach inertial mass coupled to the actuator (the magnitude of forces applied to the object or sphere (34) is coupled to the actuator (28), the actuator and the inertial mass collectively configured to output the haptic feedback, the haptic feedback being an inertial haptic feedback wherein the combination if the magnitude of forces applied to the sphere and actuator is a haptic feedback.

Regarding claim 44, Rosenberg et al. teach the user object feels like it is captured in a "groove" where there is a restoring force along the degree of freedom to keep the stick in the groove. This restoring force groove is centered about a center groove position C located at the current location of the user object when the host command was received. Alternatively, the location of the center groove position can be specified from a command parameter along one or more degrees of freedom (column 38, lines 4-12).

Regarding claim 45, Rosenberg et al. teach other parameters can be used to provide a variety of haptic sensations to the user through the user object 34 to simulate many different types of tactile events. For example, typical haptic sensations may include a virtual damping (described above), a virtual obstruction, and a virtual texture. Virtual obstructions are provided to simulate walls, obstructions, and other uni-directional forces in a simulation, game (column 19, lines 39-46).

Regarding claim 46, Rosenberg et al. teach the microprocessor controls actuators to provide forces on the user object and provides the sensor data to a host computer that is coupled to the interface device. The host computer sends high level host commands to the local microprocessor, and the microprocessor independently implements a local reflex process based on the high level command to provide force values to the actuators using sensor data and other parameters (abstract).

Regarding claim 47, Rosenberg et al. teach said actuator is a first actuator and further comprising a second actuator, each of said actuators providing force in a separate degree of freedom, and wherein said direction parameter represents an angle in a two dimensional plane defined by said two degrees of freedom (column 56, lines 9-14).

Regarding claim 48, Rosenberg et al. teach an actuator coupled to said user manipulatable object for providing a force resistance to motion of said user manipulatable object along at least one of said degrees of freedom with respect to said origin, said resistance to motion generated in response to commands from said host computer and in coordination with said graphical environment (column 52, lines 59-65).

Regarding claim 49, Rosenberg et al. teach virtual textures can be used to simulate a surface condition or similar texture. For example, as the user moves a joystick or other user object along an axis, the host computer sends a rapid sequence of commands to repetitively 1) apply resistance along that axis, and 2) to then immediately apply no resistance along that axis, as according to a reflex process. This frequency is

based upon the travel of the joystick handle and is thus correlated with spatial position (column 19, lines 53-61); microprocessor implements one of a plurality of force routines selected in accordance with said command identifier and said command parameters associated with a received host command, wherein said microprocessor locally produces a force feedback sensation in accordance with said force routine by modulating said actuator, said local modulation of said actuator being inflated in response to said received host command and performed by said microprocessor independently of further interaction from said host computer during a period of time, thereby freeing said host to perform other tasks (column 63, lines 15-25); and microprocessor 26 can send sensor signals to host computer 12 via a uni-directional bus 25 and a game port, while host computer 12 can output force feedback signals from a serial port to microprocessor 26 via a uni-directional bus 24. Other combinations of data flow configurations can be implemented in other embodiments (column 8, lines 29-34).

Regarding claim 50, Rosenberg et al. teach inertial mass coupled to the actuator (the magnitude of forces applied to the object or sphere (34) is coupled to the actuator (28), the actuator and the inertial mass collectively configured to output the haptic feedback, the haptic feedback being an inertial haptic feedback wherein the combination if the magnitude of forces applied to the sphere and actuator is a haptic feedback.

Regarding claim 51, Rosenberg et al. teach a sphere Fig.7 (34);

a sensor configured to output sensor signals associated with a movement of the sphere

in the rotary degree of freedom (Fig.1 (28)); and an actuator configured to output haptic feedback approximately along an axis that is substantially linear to an extended portion of the sphere, the haptic feedback being based on the sensor signals (Fig.1 (30)).

Regarding claim 52, Rosenberg et al. teach inertial mass coupled to the actuator (the magnitude of forces applied to the object or sphere (34) is coupled to the actuator (28), the actuator and the inertial mass collectively configured to output the haptic feedback, the haptic feedback being an inertial haptic feedback wherein the combination if the magnitude of forces applied to the sphere and actuator is a haptic feedback.

Regarding claim 53, Rosenberg et al. teach when the microprocessor detects the user object moving outside this snap distance, it turns off the groove forces. This snap-out feature can be implemented equally well by the host computer 12 sending a clear command to turn off forces. Also, a deadband DB can also be provided to allow the user object to move freely near the center groove position C, specified with a deadband command parameter. A style command parameter indicates the orientation of the groove along one or more degrees of freedom (e.g., horizontal, vertical, diagonal). For example, horizontal and vertical grooves can be useful to provide forces for scroll bars in windows. A user moving a cursor in a graphical user interface can feel groove forces moving the cursor and user object toward the middle of the scroll bar (column 38, 22-35).

Regarding claim 54, Rosenberg et al. teach when the microprocessor detects the user object moving outside this snap distance, it turns off the groove forces. This snap-

out feature can be implemented equally well by the host computer 12 sending a clear command to turn off forces. Also, a deadband DB can also be provided to allow the user object to move freely near the center groove position C, specified with a deadband command parameter. A style command parameter indicates the orientation of the groove along one or more degrees of freedom (e.g., horizontal, vertical, diagonal). For example, horizontal and vertical grooves can be useful to provide forces for scroll bars in windows. A user moving a cursor in a graphical user interface can feel groove forces moving the cursor and user object toward the middle of the scroll bar (column 38, 22-35).

Regarding claim 55, Rosenberg et al. teach Position control is not a popular mapping for traditional computer games, but may be used in other applications such as medical procedure simulations or graphical user interfaces. Position control is an intuitive and effective metaphor for force feedback interactions because it is a direct physical mapping rather than an abstract control paradigm. In other words, because the user object experiences the same physical manipulations as the entity being controlled within the computer, position control allows physical computer simulations to be directly reflected as realistic force feedback sensations. Examples of position control in computer environments might be controlling a paddle in a pong-style tennis game or controlling a cursor in a windows desktop environment (COLUMN 37, LINES 4-17).

Regarding claim 56, Rosenberg et al. teach Host commands may include commands to provide forces on the user object such as restoring forces, vibration forces, texture forces, a barrier forces, attractive/repulsive force fields, damping forces,

groove forces, and a paddle-ball force. Typical command parameters include a magnitude parameter, a duration parameter, a direction parameter, a style parameter, and a button parameter to control the force output by the actuator. This provides a high level, standard force feedback command protocol for the efficient use by developers of force feedback software to be implemented on the host computer system (column 4, lines 27-37).

Regarding claim 57, Rosenberg et al. teach other parameters can be used to provide a variety of haptic sensations to the user through the user object 34 to simulate many different types of tactile events. For example, typical haptic sensations may include a virtual damping (described above), a virtual obstruction, and a virtual texture. Virtual obstructions are provided to simulate walls, obstructions, and other uni-directional forces in a simulation, game (column 19, lines 39-46).

Regarding claim 58, Rosenberg et al. teach object 34 which is cover potion to gimbal mechanism 140 which is part of the housing for the object (see Fig.7). Regarding claim 36, Rosenburg et al. teach the object Fig.7 (34) is like a button to provide input to a host computer.

Regarding claim 59, Rosenburg et al. teach the object Fig.7 (34) is like a button to provide input to a host computer.

Regarding claim 60, Rosenberg et al. teach the microprocessor controls actuators to provide forces on the user object and provides the sensor data to a host computer that is coupled to the interface device. The host computer sends high level host commands to the local microprocessor, and the microprocessor independently

implements a local reflex process based on the high level command to provide force values to the actuators using sensor data and other parameters (abstract).

Regarding claim 61, Rosenberg et al. teach force feedback control parameters ("force parameters") are internal parameters that are provided or updated by command process 384 and are used by force algorithm computation and actuator control process 388 (see Figure 18).

Conclusion

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jean Lesperance whose telephone number is (571) 272-7692. The examiner can normally be reached on from Monday to Friday between 10:OOAM and 6:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Shalwala Bipin, can be reached on (571) 272-7681.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(571) 273-8300 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

Jean Lesperance

Art Unit 2629

Date 3/16/2008

/Bipin Shalwala/

Supervisory Patent Examiner, Art Unit 2629